



SOLAPUR UNIVERSITY, SOLAPUR

Syllabus for B.Sc. II Zoology
Syllabus to be implemented from June 2011 onwards

SEMESTER- III THEORY

Paper	Title of the paper	Marks
V	Animal Diversity III	50
VI	Cell Science, Genetics, Biological Chemistry and Economic Zoology	50

SEMESTER- IV THEORY

Paper	Title of the paper	Marks
VII	Animal Diversity IV	50
VIII	Histology & Physiology	50

PRACTICAL TO BE TAKEN AT THE END OF SEMESTER-IV

Practical	Title of the practical	Marks
I	Practical Based on Theory Paper V, VI, VII and VIII	100

SOLAPUR UNIVERSITY, SOLAPUR

SYLABUS B.Sc. II ZOOLOGY W.E.F. from June 2011

SEMESTER –III Paper - V Animal Diversity III

- 1) Salient features and Classification up to classes of the following with suitable examples: Arthropoda, Mollusca, Echinodermata and Hemichordata [4]
- 2) Arthropoda – Type Study – Cockroach [13]
 - i) Systematic Position
 - ii) Habits and Habitats
 - iii) External Morphology
 - iv) Study of the following systems:
 - a) Digestive system
 - b) Respiratory System
 - c) Circulatory system
 - d) Nervous system & Compound eyes
 - e) Excretory system
 - f) Reproductive system
 - g) Sense organs with reference to ommatidia, Mosaic vision
- 3) Mollusca: Type study – *Pila* [13]
 - a) Systematic position
 - b) Habits & Habitats
 - c) External morphology: Shell & Pallial Complex
 - d) Economic Importance of pila
 - e) Study of following systems:
 - i) Digestive system
 - ii) Respiratory system
 - iii) Blood Vascular System
 - iv) Nervous system & sense organs-Eye, Osphradium, Statocyst
 - v) Excretory system
 - vi) Reproductive system
- 4) Study of following general topics:
 - i) Insect mouth parts: Cockroach, Honeybee, House fly, butterfly and mosquito [4]
 - ii) Mosquito as insect vector in human diseases with reference to: Malaria, Filaria, & Dengue disease (Prevention, Control measures and Treatment expected). [2]
 - iii) Foot in mollusca [2]
 - iv) Affinities in Hemichordata [2]

TOTAL: 40

**Semester III
Paper VI**

Cell Science, Genetics, Biological Chemistry and Economic Zoology

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|---|-----|
| 1) Cell division: Mitosis and meiosis | [3] |
| 2) Linkage: complete and incomplete and its significance.
Crossing over: Mechanism, Cytological evidence, significance of crossing over. | [6] |
| 3) Interaction of genes: | [2] |
| i) Supplementary genes | |
| ii) Complementary genes | |
| 4) Biomolecules & their significance: | [5] |
| Carbohydrates, proteins and lipids | |
| ii) Nucleic Acids: | |
| DNA- Structure & Biological significance | |
| RNA-Structure, types and Biological significance | |
| 5) Economic Fishery | [4] |
| i) Freshwater Fish farming – Construction and Maintenance. | |
| ii) Maintenance of glass Aquarium and Ornamental fishes. | |
| 6) Economic Entomology- | [5] |
| A) Sericulture | |
| i) Types of Silk moth | |
| ii) Morphology of mulberry silk moth | |
| iii) Life cycle | |
| iv) Rearing of silkworm | |
| vii) Economic importance. | |
| B) Apiculture | [4] |
| i) Types and castes | |
| ii) Honey comb | |
| iii) Bee keeping | |
| iv) Economic importance. | |
| 7) Dairy Science | [4] |
| i) Breeds | |
| ii) Feeding | |
| iii) Housing | |
| iv) Economic importance | |
| v) Milk and Milk Products. | |
| 8) Poultry Science: | [4] |
| i) Poultry breeds | |
| ii) Feeding | |
| iii) Housing | |
| iv) Management | |
| v) Food value- egg and poultry meat. | |
| vi) Poultry diseases – Small pox and Ranikhet. | |

9) Goat Farming

[4]

i)Breeds

ii)Feeding

iii)Housing

iv)Economic importance.

Total- 40

List of Recommended Books: (For Paper V and VI)

1. Arthropoda, Mollusca and Echinodermata – Kotpal. R.L. (Series)
 2. Mollusca – Morten. J.E.
 3. Echinodermata – Nichols D.
 4. Invertebrate – Kotpal .R.C.
 5. Invertebrate Zoology – Jordan E.L. and Verma.P.S
 6. Biology of Invertebrates – Russel-Hunter
 7. The Text Book of Invertebrate Zoology - Shrivastava
 8. The Cell – Bruce Albert
 9. The Cell - De Robertis
 10. Cell biology – C.B. Powar
 11. The cell - Cooper
 12. Biochemistry – Lehninger A.L.
 13. Biochemistry - Das
 14. Biochemistry Vol I – Dasgupta. S. K
 15. Biochemistry – Voet and Voet
 16. Biochemistry – Stryer
 17. Molecular biology – Gupta .P.K
 18. Principles of Genetics - Gardner
 19. Genetics - Strickberger
 20. Cell biology, Genetics, Evolution – Verma Agrawal
 21. Molecular Biology of the Gene – Watson J.D.
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SEMESTER –IV
Paper –VII
Animal Diversity –IV

- 1) Salient features and classification of Reptiles, birds and mammals up to orders with suitable examples. [3]
- 2) Type study: Rat [18]
- i) Systematic position
 - ii) Habits and Habitats
 - iii) External Morphology
 - iv) Study of following systems:
 - a) Digestive system
 - b) Respiratory system
 - c) Circulatory system
 - d) Excretory system
 - e) Nervous system- Brain & spinal cord
 - f) Sense Organs- Eye & Ear
 - g) Reproductive system
- 3) Study of Following General Topics:
- i) Mesozoic reptiles [2]
 - ii) Poisonous and non-poisonous snakes [4]
 - a) Identification features
 - b) Poison apparatus
 - c) Venom, antivenom, production, Effects of venom & its medicinal uses.
 - d) Snake bits & first aid treatment.
 - iii) Archaeopteryx. [2]
 - iv) Aerial adaptations in birds [3]
 - v) Beak and leg modifications in birds [2]
 - vi) Migration in birds [2]
 - vii) Salient features and affinities of monotremes and marsupials [2]
 - viii) Dentition in mammals [2]

Total periods: [40]

**Semester IV
Paper VIII
Histology and Physiology**

1. Tissues : Review of following tissues with reference to origin, location and functions [6]
 i) Epithelial ii) Connective iii) Muscular iv) Nervous
2. Histology of mammalian organs [14]
 i) Tooth ii) Salivary gland iii) Esophagus iv) Stomach
 v) Ileum vi) Rectum vii) Liver viii) Pancreas
 ix) Kidney x) Spinal cord xi) Testis xii) Ovary
 xiii) Uterus xiv) Pituitary
- 3) Reproductive physiology [15]
 a) Hormones of pituitary
 b) Sex hormones
 c) Oestrous cycle
 d) Menstrual cycle
 e) Hormonal control of pregnancy, parturition and lactation
 f) Hormonal control of testicular activity
 g) Contraceptives
 h) In-vitro fertilization
 i) Amniocentesis
4. Body defense mechanism [5]
 A) Immune system
 i) Humoral immunity and its mechanism
 ii) Cellular immunity and its mechanism
 B) Organs involved in immune system
 a) Bone marrow
 b) Lymphatic nodes

Total Periods:[40]

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List of Recommended Books: (For paper VII and VIII)

- 1) Rat : Rowett
- 2) Rat : Kshirsagar. G.R.
- 3) T.B. of vertebrate Zoology – Prasad.S.N.I
- 4) Vertebrates – Kotapal.R.C
- 5) Comparative vertebrate anatomy- Hyman.L.H.
- 6) Histology – Ham.A.W.
- 7) Baileys's T.B. of Histology – Williams and Williams
- 8) An Atlas of Histology – Heineman Educational Book Ltd. London
- 9) Microscopic anatomy of vertebrates – Lea and Febigen, Philadelphia.
- 10) Histology of Mammals – Atavale M.V. and Latey A.N.
- 11) Human physiology by Chatterjee.C.C.
- 12) Physiology – A.C. Guyton

Practical Course in Zoology for B. Sc. II
Semester III and IV
[To be taken at the end of Semester IV]
PRACTICAL - I

1. Classification with morphological peculiarities of the following up to classes.
 - a) Arthropoda – Apus, Balanus, Prawn, Lobster, King-crab, Grasshopper, Butterfly Moth, Millepede, Centipede, Scorpion, Spider, Peripatus
 - b) Mollusca – Chiton, Dentalium, Patella, Aplysia, Snail, Slug, Mytilus, Pearl Oyster, Sepia, Octopus
 - c) Echinodermata – Sea-lily, Brittle star, Sea star, sea urchin, sea cucumber
 - d) Hemichordata - Balanoglossus
2. Cockroach
 - a) External characters and sexual dimorphism
 - b) Dissection of the following system:
 - i) Digestive system
 - ii) Nervous system
 - iii) Male reproductive system
 - iv) Female Reproductive system
 - c) Temporary preparation of the following
 - i) Walking leg
 - ii) Mouth parts
 - iii) Thoracic spiracles
 - iv) Salivary gland
 - v) Gizzard
 - vi) Gonapophyses
 - vii) Cornea
3. Pila
 - A) External characters – Shell, Pallial complex
 - B) Dissections :
 - i) Digestive system
 - ii) Nervous system
 - iii) Demonstration of Heart
 - C) Temporary preparation of the following:
 - i) Osphradium
 - ii) Radula
 - iii) Statocyst
4. Study of mouth parts of : Honey bee, Mosquito, Butterfly, Housefly
5. Mosquito as disease vector : Whole mounts of Anopheles, Culex, Aedis
6. Study of foot in mollusca with reference to Chiton, Pila, Mytilus, Unio, Sepia/ Octopus
7. Study of mitosis with root tip chromosomes
8. Examples in genetics (at least 10 examples) : Examples based on Crossing over, Linkage, interaction of genes
9. Detection of Carbohydrates (Glucose, Fructose, Maltose/Lactose, Starch), Proteins and Lipids.
- 10) Glass aquarium fishes (Any five fishes)
- 11) Apiculture – Kinds and castes of Bees, Honeycomb, Honey, Bee wax
- 12) Sericulture - Study of silk moth, silk cocoons, and silk.
- 13) Dairy Science – Study of Milk and Milk products.
- 14) Poultry Science – Different kinds of Poultry birds, Eggs, and Poultry manure.

PRACTICAL – II

1. Classification with morphological peculiarities of the following up to orders :
 - i) Reptiles – Turtle, Tortoise, Chameleon, Garden lizard, Crocodile
 - ii) Aves – Duck, Kite, Woodpecker, Sparrow, Sunbird, Vulture, Kingfisher
Fowl,
 - iii) Mammals – Platypus, Bat, Scaly ant eater, Loris, Rabbit (In case of non-availability of specimen models / photographs/ sketches can be used)
2. Rat : Demonstration practical
Study of the following system :
 - j) Digestive system
 - ii) Respiratory system
 - iii) Arterial system
 - iv) Venous system
 - v) Excretory system
 - vi) Reproductive system
3. Dissection of Brain of Rat / Bird
4. Temporary stained preparation of the following:
 - i) Blood of mammal ii) Pecten of bird iii) Sclerotic plate of bird
 - iv) Collumela of bird v) Hyoid apparatus of bird
5. Study of Mesozoic reptiles using charts / models
6. Identification of the following poisonous and non poisonous snakes :
 - i) Cobra ii) Russel's Viper iii) Indian little Viper (Phoorsa) iv) Krait
 - v) Sea snake vi) Rat snake vii) Sand boa
7. Beak and leg modifications with reference to :
 - i) Parrot ii) Woodpecker iii) Heron iv) Duck iv) Sparrow / Pigeon
 - v) Hawk / Kite vi) Owl vii) Vulture
8. Dentition in mammals : Rabbit, Sheep, Rat / Rabbit, Dog , Man\
9. Study of histological structure of the following organs :
 - i) Tooth (V.S.) ii) Salivary gland iii) Oesophagous iv) Stomach V) Ileum
 - vi) Rectum vii) Liver Viii) Pancreas ix) Kidney x) Testis xi) Ovary
 - xii) Uterus xiii) Pituitary gland xiv) T.S. Spinal cord
10. Study of rat sperm and vaginal smear
11. Study of following abnormal urine constituents : Glucose, Bile, Blood and Albumin
12. Study of blood group antigens
13. Study of following contraceptives : Oral contraceptives pills, Intrauterian device, Condom

Study or Excursion Tour :

As a part of practical visit to sea –shore / any suitable place of zoological interest to study animal diversity and Economic Zoology. Six day tour is recommended. A report is to be submitted at the time of examination.

Distribution of Marks for Practical Examination.

PRACTICAL I :

Q.1. Dissection	Marks 10
Q.2. Temporary preparation / Mounting	Marks 05
Q.3. Cytological preparation	Marks 06
Q.4. Genetics example	Marks 08
Q.5. Biochemical tests	Marks 06
Q.6. Identification / Spotting	Marks 10
Q.7. Journal (Practical Record Book)	Marks 05
Total Marks [50]	

PRACTICAL II :

Q.1. Dissection	Marks 10
Q.2. Temporary preparation / Mounting	Marks 05
Q.3. Physiological experiment / Abnormal constituent of urine	Marks 06
Q.4. Examination of vaginal smear / Sperm smear / Blood group Antigens	Marks 08
Q.5. Submission of excursion report and viva based on it	Marks 06
Q.6. Identification / Spotting	Marks 10
Q.7. Journal (Practical Record Book)	Marks 05
Total Marks [50]	

B.Sc. II : Zoology Equivalence to old Syllabus :

Old Paper III - **Animal Diversity III, Cell Science, Genetics & Biological Chemistry.**

**New Paper V and VI Animal Diversity III and
Cell Science, Genetics, Biological Chemistry and
Economic Zoology
(Some changes in paper III Section II and Paper VI)**

Old Paper VI- Animal Diversity IV , Histology & Physiology

New Paper VII and VIII Animal Diversity IV and Histology & Physiology

- There is no equivalence for practical of old and new course except few minor changes. The student should appear for practical based on new course only.

Solapur University, Solapur

Nature of Question Paper For Semester Pattern

- Faculty of Science
(w.e.f. June 2011)



Time :- 2 hrs.

Total Marks-50

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|-----------------|---|-------------|
| Q. No.1) | Multiple choice questions. | (10) |
| | 1) -----
a) b) c) d) | |
| | 2)
3)
4)
5)
6)
7)
8)
9)
10) | |
| Q.No.2) | Answer any Five of the following | (10) |
| | i)
ii)
iii)
iv)
v)
vi) | |
| Q.No.3) | A) Answer any Two of the following | (06) |
| | i)
ii)
iii) | |
| | B) Write the Answer/Solve/Problem/Note | (04) |
| Q.No.4) | Answer any Two of the following | (10) |
| | i)
ii)
iii) | |
| Q.No.5) | Answer any One of the following | (10) |
| | i)
ii) | |